THE RECOVERY KERNEL

HEALTHCARE PROVIDER BRIEF

A Clinical Summary for Prescribers, Pharmacists & Mental Health Providers

Your patient participates in the Recovery Kernel — an open-source, pharmacogenomics-informed addiction recovery framework. This brief summarizes the clinical framework, the supplements your patient may be following, relevant lab work, and the expected recovery timeline.

This is not a substitute for your clinical judgment. It is a set of questions and hypotheses your patient wants to explore with you, grounded in CPIC guidelines and peer-reviewed literature.

1. What Is the Recovery Kernel?

The Recovery Kernel is a neurogenomics-based recovery framework built on the premise that treatment-resistant addiction is frequently driven by specific, testable genetic variants that standard treatment protocols do not address. The framework targets seven primary genetic systems:

Gene	Clinical Role	Addiction Relevance
MTHFR	Rate-limiting enzyme for active folate → SAMe → neurotransmitter synthesis	Variants reduce dopamine/serotonin baseline; substances compensate for this deficit
COMT Val158Met	Dopamine/NE clearance speed in PFC	Val/Val (Warrior): fast clearance → stimulant-seeking. Met/Met (Worrier): slow → depressant-seeking
CYP2D6	Primary metabolizer of opioids, many antidepressants	PM: prodrugs ineffective; UM: codeine/tramadol potentially fatal
CYP3A4/5	Processes ~50% of all drugs incl. fentanyl, most benzodiazepines	Substrate collision risk; grapefruit inhibition documented
GABRA2/ GABRB3	GABA-A receptor subunit architecture — inhibitory tone	High-risk: impaired impulse control, accelerated alcohol/benzo dependence, seizure risk
OPRM1 A118G	Mu-opioid receptor sensitivity	G allele: requires higher opioid doses; better naltrexone response
DRD2 Taq1A	Dopamine D2 receptor density	A1 variant: ~30% reduced receptor density → reward deficiency syndrome

2. Recommended Lab Work & Pharmacogenomic Testing

Test	Priority	Est. Cost	Clinical Relevance
Homocysteine (serum)	High — first line	$30–80 (often	MTHFR proxy. Target <10

		covered)	µmol/L.
CYP2D6 genotype (GeneSight / OneOme)	CPIC-Actionable	~$330 self-pay	Changes opioid and antidepressant prescribing decisions.
MTHFR C677T + A1298C	High	$40–150 (often covered)	Confirms methylfolate protocol. T/T: avoid all folic acid.
COMT Val158Met	Moderate	$40–100	Shapes antidepressant and exercise prescription.
Vitamin B12 (serum)	High	$20–50	Target >400 pg/mL.
Vitamin D 25-OH	Moderate	$30–60	Target 40–60 ng/mL.
GABRA2/GABRB3 (if alcohol/benzo history)	High if applicable	In GeneSight panel	Seizure risk quantification during withdrawal.

3. Supplement Protocols

These supplements are mechanism-based, not addiction-specific clinical trial evidence. Key drug interactions are noted in the final column.

Supplement	Dose	Target Profile	Provider Notes
L-Methylfolate (NOT folic acid)	7.5–15mg/d	MTHFR variants	T/T: avoid ALL synthetic folic acid. Titrate slowly — overmethylation (anxiety, insomnia) at high doses.
Methylcobalamin B12	5,000mcg sublingual/d	MTHFR	No significant interactions. Monitor levels at 3 months.
Magnesium Glycinate	400–800mg/d	Worrier; GABRA2	Caution: renal impairment; mild potentiation of antihypertensives.
L-Theanine	400mg twice daily	Worrier; GABRA2	Additive sedation with benzos possible — monitor.
L-Tyrosine	1–2g/d (empty stomach)	Warrior; MTHFR	Contraindicated with MAOIs. Caution with thyroid disease. Do not combine with levodopa.
NAC (N-Acetylcysteine)	1,200–1,800mg/d	All profiles	RCT evidence for craving reduction. Caution with nitroglycerin.
SAMe	800mg/d (morning)	Worrier; MTHFR	Contraindicated in bipolar disorder without mood stabilizer. Avoid with MAOIs. Can precipitate hypomania.
Omega-3 EPA/DHA	2–3g/d	All profiles	Mild anticoagulant >3g — notify if on warfarin.
Taurine	1,000mg/d	GABRA2; Worrier	Well-tolerated. No significant interactions at this dose.

4. Recovery Timeline — Assessment to Homeostasis

Phase	Timeframe	Clinical Milestones
Phase 1: Biological Foundation	Months 1–3	Methylation protocol titrated. Homocysteine trending down. Sleep quality improving. Energy stabilizing. Brain fog clearing. Cravings beginning to reduce (20–40%).
Phase 2: Taper + Support	Months 3–6	Substance reduction initiated after Phase 1 foundation confirmed. Full supplement stack in place. Emotional resilience measurably increasing. Cravings reduced 40–70%.
Phase 3: Environmental Redesign	Months 6–12	Neurochemical baseline approaching homeostasis. Exercise, sleep architecture, and social environment reconfigured to match genotype. Supplement taper begins based on symptom resolution.
Beyond Year 1	Ongoing	Supplements discontinued at symptom resolution — not indefinitely. If neurochemical destabilization recurs (illness, major stress), participant may return to baseline

		supplement stack to restore methylation. This is not supplement dependency — it is maintenance of genetic terrain.

5. Before & After: Expected Outcomes at Homeostasis

Scale 1–10. Before = typical intake presentation. After = expected Month 6 with adherent protocol. Early weeks may show little change or temporary worsening before marked improvement at Months 3–6.

Depleted Worrier (MTHFR High + COMT Worrier)

Measure	AT INTAKE (avg)	AT HOMEOSTASIS ~Month 6
Mood stability	2/10	7/10
Energy level	3/10	7/10
Anxiety intensity	8/10	3/10
Sleep quality	3/10	8/10
Craving intensity	8/10	2/10
Brain clarity	3/10	8/10

Understimulated Warrior (MTHFR High + COMT Warrior)

Measure	AT INTAKE (avg)	AT HOMEOSTASIS ~Month 6
Motivation / drive	2/10	7/10
Mood stability	4/10	7/10
Energy level	3/10	8/10
Craving intensity	7/10	2/10
Focus / attention	3/10	8/10
Sleep quality	4/10	7/10

GABRA2 High-Risk (Alcohol / Benzo Pattern)

Measure	AT INTAKE (avg)	AT HOMEOSTASIS ~Month 6
Impulse control	2/10	6/10
Anxiety at baseline	9/10	3/10
Sleep without aids	2/10	7/10
Craving interruption	1/10	6/10
Emotional regulation	2/10	7/10

⚠ CRITICAL SAFETY NOTES FOR PROVIDERS

FOLIC ACID CONTRAINDICATION: Synthetic folic acid worsens methylation in MTHFR T/T patients. Replace with L-methylfolate in all supplementation and fortified foods.

ALCOHOL/BENZO WITHDRAWAL: Any significant dependence requires medical supervision. The Kernel explicitly defers all taper decisions to prescribers. GABRA2/GABRB3 variants increase seizure risk.

SAMe + BIPOLAR: Contraindicated without concurrent mood stabilizer. Can precipitate hypomania.

CYP450 POLYPHARMACY: Patients on 3+ medications with PM/UM status require pharmacist-level drug interaction review before any addition.

Resources

· CPIC Guidelines: cpicpgx.org

· FDA Pharmacogenomic Biomarkers: fda.gov/drugs/science-and-research/table-pharmacogenomic-biomarkers-drug-labeling

· Recovery Kernel (full text, open access): github.com/JRToken-NGI/recovery-kernel

· Recovery Kernel (PDF/ePub/Kindle): archive.org/details/the-recovery-kernel

· Recovery Kernel (YouTube reading, free): search 'Recovery Kernel' on YouTube

· GeneSight panel: genesight.com | Interactions Checker: see GitHub repository